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SPRINGFIELD ARMORY

SPRINGFIELD, MASSACHUSETTS

RESEARCH AND DEVELOPMENT

NOTES ON DEVELOPMENT TYPE MATERIEL

DESCRIPTION OF RIFLE, CALIBER .30 T25

PROJECT NO. TS2-2015

PREPARED BY SPRINGFIELD ARMORY UNDER THE DIRECTION OF THE OFFICE, CHIEF OF ORDNANCE

ITEM 30 R T25 DATE 29 Dec. 1949 SA-NM 11-2030

Springfield Armory

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(6) NOTES ON
DEVELOPMENT TYPE MATERIEL
FOR
RIFLE, CALIBER .30, T25 [U] (8)

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~~RESEARCH AND DEVELOPMENT DIVISION~~
~~SPRINGFIELD ARMORY~~

(16) ORD-TS2-2015

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A. GENERAL DESCRIPTION:

1. This rifle is a light, compact shoulder weapon which delivers both full, and semiautomatic fire, selectively. It is gas-operated, magazine-fed, (20 rd.) 42" long overall, and weighs 7 lbs., basically.

2. Briefly, operational power is derived from a "Gas cutoff and expansion system" whereby a metered quantity of gas is bled from the barrel, trapped, and allowed to expand in a unique gas cylinder and piston arrangement.

3. The advantages of this actuating system lie in the facts that the applied power may be regulated as to magnitude, duration, and rate of application. Since work accomplished is the product of force and distance it will be seen that in this system, forces of a relatively low order acting over a relatively long distance produce operating energy equivalent to that produced by the conventional gas piston which gives a very short impulse of high intensity.

4. It will also be seen that the lowered accelerations and velocities of moving parts will diminish the magnitude of stress and impact values.

5. The rifle is fitted with a combination recoil-check and compensator. This, together with the straight line stock gives excellent stability to the weapon during automatic firing.

B. GENERAL OPERATION:

1. On firing a chambered round, the bullet passes through the bore uncovering the gas port and allowing gas at high pressure to enter the gas cylinder and hollow piston. The piston moves to the rear cutting off the flow of gas from the bore. From the instant of cutoff, through the remainder of the power stroke, the piston is actuated by the expansion of the gas trapped within the system.

2. In its rearward movement, the piston drives back the operating rod with which it is in continuous contact. In turn, the operating rod unlocks and retracts the bolt, effecting extraction. In addition the bolt rotates the hammer back and downward into engagement with the sear. At the rear limit of its travel, the bolt is arrested by a hard fibre buffer which is located in the rear end of the receiver.

3. On coming to rest, the bolt is impelled forward by the operating rod which is actuated by driving springs which were compressed during the recoil stroke.

4. The top cartridge is stripped from the magazine and chambered by the bolt which is carried forward and locked by the operating rod. The weapon is now ready to repeat the cycle.

5. In the event that bolt closure is incomplete, an incorporated safety provision prevents ignition of the chambered round on manual closing of the bolt. Release of the trigger to grasp the operating handle automatically engages the hammer thus preventing firing.

6. After the last round has been fired, an extension of the magazine follower blocks the bolt in its rearmost position. Withdrawal of the empty magazine permits the bolt to move forward into engagement with the automatic sear which holds the action open until the trigger is pulled.

C. FIRE CONTROL:

Semiautomatic fire:

1. A complete cycle will be described initiated with the action open, a loaded magazine in place, and the selector in the "Repeat" position.

2. The trigger is pulled disengaging the automatic sear from the bolt, allowing it, together with the operating rod, to be propelled forward by the energy stored in the compressed driving springs. The top cartridge is stripped from the magazine and chambered by the bolt.

3. In addition, as the bolt moves forward it clears the hammer allowing it to rotate forward until it is engaged by the sear which prevents the hammer from following the bolt to its forward position.

NOTE: At this stage the following conditions prevail: The trigger has been pulled and held back, the action is closed and locked on a chambered round, and the hammer is engaged and held back by the sear.

4. Release of the pulled trigger allows it to move forward resulting in the sear disengaging from the hammer which then moves into engagement with the trigger. This completes the closing and making ready to fire of the rifle, starting from conditions as set forth in paragraph 1 under heading, semiautomatic fire.

5. A second pull on the trigger releases the hammer, the round fires and the mechanism goes through the operating cycle as described previously under heading General Operation with the addition that when the hammer is cammed back by the recoiling bolt, it is engaged by the sear and held until the trigger is released preparatory to firing another shot. When such release occurs the sear disengages from the hammer which is then engaged by the trigger.

6. Attention is directed to the fact that two pulls on the trigger were necessary to the firing of the first round of semiautomatic fire, after which a round will be fired on each pull of the trigger while cartridges remain in the magazine.

Full Automatic Fire:

1. A complete cycle will be described initiated with the action open, a loaded magazine in place, and the selector set on the "Automatic" position.

2. Moving the selector to the automatic position results in the sear being forced back and held in such a position that engagement with the hammer is no longer possible. For all practical considerations the sear is rendered inoperative for so long as the selector remains in this position.

3. A pull on the trigger disengages the automatic sear from the bolt allowing it and the operating rod to go forward chambering a round from the magazine as in semiautomatic fire, however the previously described blocking of the sear allows the hammer to go forward until it is arrested by the hammer lock.

4. During the movement remaining to the operating rod after the locking of the bolt has been accomplished, the hammer lock is disengaged from the hammer by a cam cut on the bottom surface of the operating rod permitting the hammer to fall. The position of this cam cut is such that the hammer may not be released until after the bolt is completely locked. Another independent means of preventing premature firing is found in the two piece firing pin which may not operate except when the bolt is in the locked position.

5. The firing of the chambered round initiates the cycle of events described in General Operation with the exception that with the sear being held out of engagement by the selector and the trigger being pulled back, the hammer will go forward into contact with the hammer lock and be held until the bolt is locked, after which it will be released to fire the chambered round. Firing the round will result in the repetition of the entire cycle thus producing full automatic firing.

Full Automatic Fire:

6. If the trigger is released at any time before the magazine is emptied, the automatic sear will engage the bolt at the end of its rearward travel and firing will be stopped with the action held open. This permits cooling air to circulate through the bore and also insures that no round will be left in the chamber to cook off in the event that the weapon had attained a high temperature from continued firing.

7. Occasionally the action may stop in the closed bolt position when the release of the trigger interrupts a burst. This will be due to the fact that the release of the trigger became complete during the closing movement of the bolt, engaging the hammer and preventing firing as noted in General Description, above.

If, due to the heat produced by extended firing, it is considered desirable to maintain the bolt in the open position to facilitate cooling, the bolt may be retracted by the operating handle and engaged by the automatic sear. In either open or closed bolt position, firing will be resumed when the trigger is pulled.

SPECIFICATIONS:

Length (overall)	42 inches
Basic Weight	7 lbs.
Type of Action	Gas-operated
" " Stock	Straightline
" " Sights	Folding
" " Feed	20 rd. magazine

A. GENERAL ASSEMBLY (Field Assembly)

1. Insert rear firing pin (41) in locking block (31) so that its front end lies in the lateral slot in the body of the locking block.

2. Re-engage locking block (31) and breech block (7) by sliding into engagement laterally.

3. With the bottom side of the receiver (58) face up and muzzle to right, place breech block assembly (with flat surface face down) at rear of receiver (with locking block (31) nearest to rear end of receiver) and slide forward to limit.

4. Slide the operating slide guide (22) onto keyways of operating slide (78), and leave it near forward end of slide. Place gun with right side of receiver face up and muzzle to right. Place slide guide over barrel as far forward as hand guard clearance will permit, and insert rear end of operating slide in actuating clearance in locking block.

5. Assemble cover (12) by sliding in and forwardly at rear end of receiver. Pull up on rear end of cover latch (27) and pull forward until able to drop latch into slots in receiver.

6. With pin of operating slide guide (22) pulled out to limit, slide rearward along keyways of operating slide and engage keyways on barrel. Joggle guide until pin may be pushed inward through clearance in barrel.

7. Place rifle with bottom side face up and muzzle to right. Insert hammer lock (30) in its seat (30A) with actuating arm to rear. Lock can be inserted in one way only.

8. Place automatic fire control group on receiver at rear end of receiver and slide into engagement with receiver slots by pushing forward slightly.

9. Cock the hammer (25) of the semiautomatic fire control group.

10. Place the semiautomatic group into position over the automatic fire control group. Press down on semiautomatic group until fire control housing ears (26a) are in line with slots in inner sides of receiver just to rear of the magazine clearance. Pull forward (about 1/8 of an inch) to engage ears with receiver slots.

11. Insert retainer pin (37) from right side of receiver. (Engages the semiautomatic and automatic groups).

12. Place free end of operating springs (85 & 86) into operating slide hole and compress to seat the operating spring guide (23) in lug on bottom of receiver.

13. Replace stock (95) by first engaging its ferrule on front end with band (1), and then lowering butt end down over fire control group. Clamp (11) must be in upward and forward position to replace stock. Lower clamp and tighten screw firmly.

B. ASSEMBLY OF BREECH BLOCK

1. Place extractor spring (87) and then extractor plunger (53) in extractor hole at forward end of breech block (7). The head of the plunger lies to the front. The edge of the wedge-shaped end of the extractor plunger should be parallel to the flat top surface of the breech block. Place extractor in its slot and hold with thumb.

2. Use slot in end of ejector spring seat to engage chisel face of extractor plunger. (See photograph.) Press extractor plunger rearward into hole in breech block, indexing the plunger slightly alternately to right and left to facilitate alignment of plunger and hole. As plunger is being pushed completely into its hole, press the extractor downward into its seat and at the same time withdrawing the ejector spring seat slightly. Press extractor in completely (definite click heard).

PRECAUTION: Do not release pressure on extractor at any time during above operation or spring and pin may fly free.

3. Insert front firing pin (40) in upper hole so that breech block's lateral hole is clear. Insert ejector assembly in lower hole with ejector spring seat having transverse clearance upwards.

4. Ejector will have to be compressed to assemble. With cartridge or drift press ejector spring seat into hole until able to insert breech block assembly pin (36) in block's lateral hole. (When pin is properly positioned, the rear end of the ejector is approximately flush with rear end of breech block.)

C. ASSEMBLY OF AUTOMATIC FIRE CONTROL GROUP

1. Hold automatic sear (75) in position and insert automatic sear pin (35) into right leg only. Place spring in position and press to align interior of spring to allow sear pin to be assembled to opposite leg of retainer.

2. Sear pin juts out right side of breech block retainer (59). Place selector (77) so that its U-shaped slot (77B) is over projecting end of sear pin.

3. Insert selector combination spring and plunger (90 and 57) in selector end hole (77A). With one hand hold selector in place and insert cam up through hole in breech block retainer (59) and as far as possible into rectangular slot (77C) in selector. (Path of cam blocked by spring). Insert drift in selector hole and compress combination selector spring & plunger until able to push cam further up into selector's rectangular slot. Remove drift and push cam completely in until selector plunger is snapped into conical pocket in cam body.

D. ASSEMBLY OF SEMIAUTOMATIC GROUP

1. Place sear (74) in hole in trigger (97) and insert sear pin (46). Engage hammer spring (82) by placing its longer hook in sear slot, the hook wire lying on right side of trigger in clearance provided.

2. Insert the assembly (sear, trigger, and hammer spring) into fire control housing (26) and insert trigger pin (47).

3. Place hammer (25) in housing, engage front hook of hammer spring, and push forward slightly to insert hammer pin (42).

E. ASSEMBLY OF GAS CYLINDER AND STABILIZER

1. Place gas cylinder (17) on barrel with loops forward and upward and push rearward until it engages keyways on barrel bearing. Cylindrical portion lies directly beneath barrel. Insert piston in muzzle end of cylinder so that port side faces underside of barrel, and push it in until rear end of piston sticks out of cylinder.

2. Turn gun with muzzle pointing up. Engage rear end of hand guard (19) with receiver lip. Place band (1) and then gas cylinder lock (29) on barrel, with slot in gas cylinder lock facing toward receiver. Move band rearward to engage front end of hand guard. Turn gas cylinder lock on as far as

it will go and then turn it backward just far enough to permit insertion of gas cylinder plug. Insert gas cylinder plug (52) and tighten firmly with wrench.

3. Slide stabilizer (92) and front sight, as a unit, on muzzle. Insert stabilizer nut (34) in slot beneath front sight with smooth end facing receiver. Screw nut on to limit, causing stabilizer and front sight to move rearward along keyways of barrel. Tighten nut with wrench.

4. Insert and tighten stabilizer nut lock screw (73) at base of front sight. Cylinder on lock screw lies in one of the wrench slots in forward face of nut to prevent accidental loosening of nut.

A. GENERAL DISASSEMBLY (Field Stripping)

(Figures in parentheses identify component on photographs.)

1. Pull operating slide (78) back to cock hammer. Breech will not close. To close breech, pull trigger to allow operating slide to move forward under spring tension.

2. Loosen the clamp screw (67) to limit. (Use cartridge.)

3. Place rifle with muzzle to right and rear sight pressing down on palm of left hand. Grasp stock at butt and lift up until stock is free of fire control housing (trigger housing), and pull lightly to rear to free stock (95) from band (1).

4. Place gun with muzzle to right and bottom side face up. Push the retaining pin (37) out with cartridge. Hold receiver (58) at rear with left hand and place right hand over magazine guard (20). Push rearward lightly (about 1/8 of an inch) with right hand to disengage the fire control housing ears (26A) of semiautomatic unit from slots in receiver. (The unit will spring upward slightly.) Lift to free it completely.

5. Rotate front end of hammer lock (30) up to limit and raise to remove from seat (30A).

6. Push automatic fire control group rearward lightly to disengage the lugs of the breech block retainer (59) and remove group.

7. Grasp rear end of operating springs (85 and 86), pull forward until operating spring guide (23) is free of seat. Pull springs to rear to remove them from operating slide hole.

8. Pull the pin of the operating slide guide (22) out to limit, and pull the guide forward until it is free of barrel keyways.

9. Pull the rear end of cover latch (27) up until rear end is clear of receiver slot and then pull to rear to slide the cover (12) and cover latch, as a unit, free.

10. Disengage operating slide (78) by lifting its rear end clear of its slot in breech block assembly. Slide operating slide guide (22) free of operating slide.

11. Push breech block assembly rearward. Lift assembly upward and free of receiver.

12. There is a slight pivoting action between the breech block (7) and the locking block (31). To disengage these pieces, pivot until separating distance is at limit and slide sideways. Remove rear firing pin (41) from locking block (31).

B. DISASSEMBLY OF GAS CYLINDER AND STABILIZER

1. Unscrew the stabilizer nut lock screw (73) found at the base of the front sight.

2. Unscrew the stabilizer nut (34) with wrench. (This action forces stabilizer (92) and the front sight, as a unit, forward along keyways on muzzle until unit is free.) Remove stabilizer nut from slot beneath base of front sight.

3. Unscrew completely the gas cylinder plug (52) with wrench. Unscrew the gas cylinder lock (29) and pull it and the band (1) forward to remove from barrel. Remove hand guard (19) by pulling it forward lightly to free its rear end from the receiver lip. Slide the gas cylinder forward off of barrel. Remove piston.

C. DISASSEMBLY OF SEMIAUTOMATIC FIRE CONTROL GROUP

1. Uncock hammer (25) by pulling trigger.

2. Push out hammer pin (42). Pull hammer rearward to release it from front hook of hammer spring (82).

3. Push out trigger pin (47). Lift assembly (trigger, hammer spring, and sear) free of housing (26). Disengage rear hook of hammer spring (82) from slot in sear.

4. Push out sear pin (46). (Sear pivots about pin with respect to trigger.)

D. DISASSEMBLY OF BREECH BLOCK

1. Place breech block with face having lengthwise step facing up. Place cartridge point on extractor (14).

2. Hold breech block firmly with one hand and with other press down on cartridge. (See photograph.) The extractor will be forced free by this action and the removal of the extractor spring plunger (53) and extractor spring (87) is possible.

(PRECAUTION: If breech block is not held firmly the front end of block will lift and spring and pin will fly free. Before releasing pressure on breech block, cover front end of block with hand to stop spring and pin from flying.)

3. Place breech block so that end which contains extractor is face down. With cartridge push ejector end (smaller of two circular ends visible) in, and using drift or extractor pin as tool, push the breech block assembly pin (36) out of block's lateral hole.

4. Remove ejector (13) and front firing pin (40) from breech block.

E. DISASSEMBLY OF AUTOMATIC FIRE CONTROL GROUP

1. Insert drift in cam slot (visible through end hole (77A) of selector), and hold cartridge against cam. (See photograph). Push drift in (to compress spring and unseat plunger from cam) and with cartridge push cam in slightly. Remove drift, cover selector end hole (77A), and push cam out, free of selector.

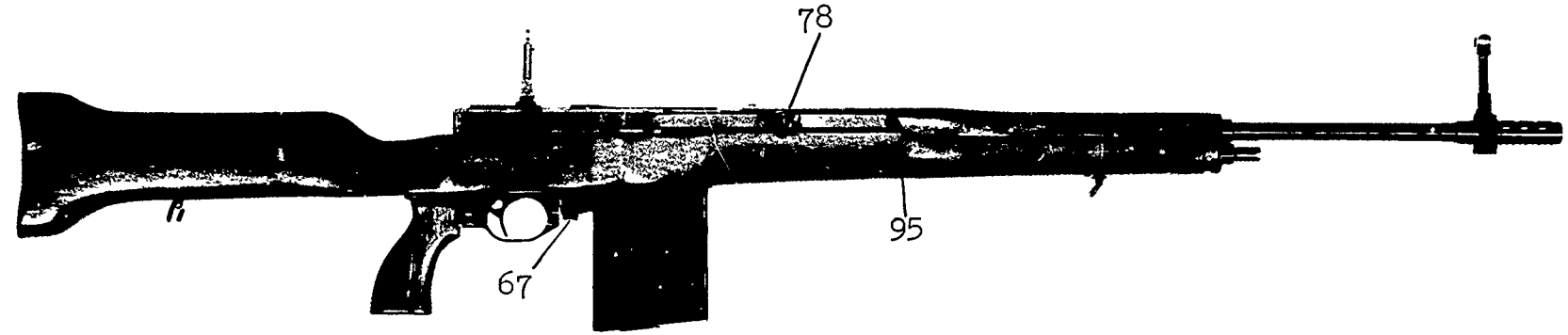
2. Remove combination selector spring and plunger (90 and 57) from selector end hole. Push out automatic sear pin (35), and remove the automatic sear (75) and the automatic sear spring (80).

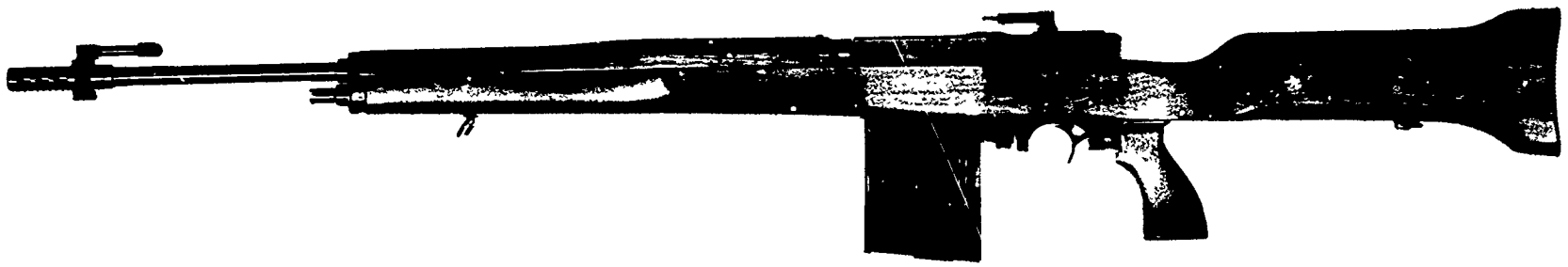
LIST OF COMPONENT PARTS OF T25 RIFLE

	Name of Part		Name of Part
1.	Band	22.	Guide, Operating Slide
2.	Bolt, Grip	23.	Guide, Operating Spring
3.	Barrel	24.	Guide, Plunger, Hammer Lock
4.	Base, Magazine	25.	Hammer
5.	Bracket, Front	26.	Housing, Fire Control
6.	Bracket, Rear	27.	Latch, Cover
7.	Breech Block	28.	Liner, Hand Guard
8.	Buffer	29.	Lock, Gas Cylinder
9.	Cam, Selector	30.	Lock, Hammer
10.	Catch, Magazine	31.	Locking Block
11.	Clamp	32.	Nut, Grip Bolt
12.	Cover	33.	Nut, Sling Swivel
13.	Ejector	34.	Nut, Stabilizer
14.	Extractor	35.	Pin, Automatic Sear
15.	Ferrule	36.	Pin, Breech Block Assembly
16.	Follower, Magazine	37.	Pin, Retainer
17.	Gas Cylinder	38.	Pin, Clamp
18.	Grip, Stock	39.	Pin, Clamp Screw
19.	Guard, Hand	40.	Pin, Firing, Front
20.	Guard, Magazine	41.	Pin, Firing, Rear
21.	Guard, Trigger	42.	Pin, Hammer

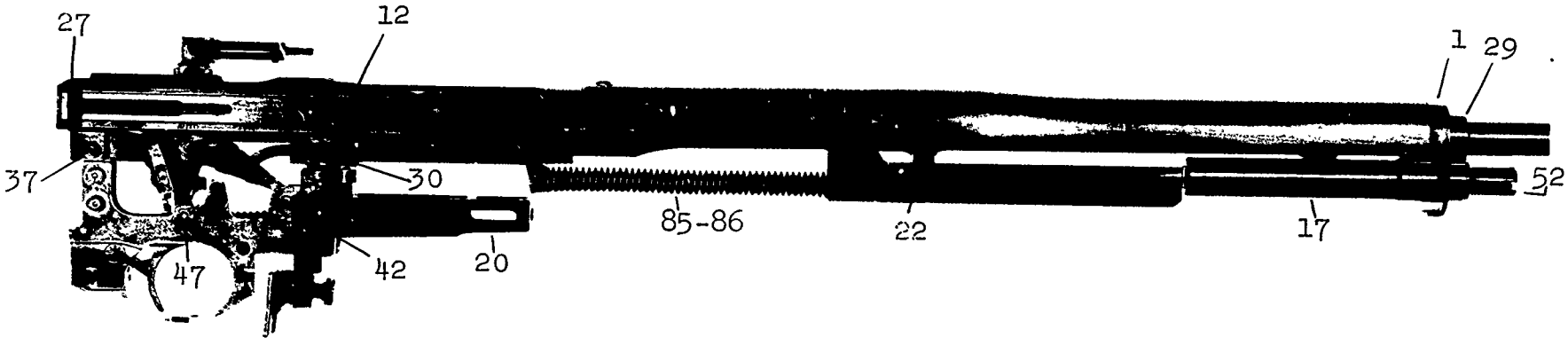
	Name of Part		Name of Part
43.	Pin, Magazine Catch	67.	Screw, Clamp
44.	Pin, Operating Slide Guide	68.	Screw, Butt Plate
45.	Pin, Retaining (Operating Slide Guide Assembly)	69.	Screw, Magazine Guard
46.	Pin, Sear	70.	Screw, Plunger Guide
47.	Pin, Trigger	71.	Screw, Sling Swivel (Front)
48.	Pin, Trigger Guard, (Front)	72.	Screw, Sling Swivel (Rear)
49.	Pin, Trigger Guard, (Rear)	73.	Screw, Stabilizer Nut Lock
50.	Piston		
51.	Plate, Butt	74.	Sear
52.	Plug, Gas Cylinder	75.	Sear, Automatic
53.	Plunger, Extractor Spring	76.	Seat, Ejector Spring
54.	Plunger, Hammer Lock	77.	Selector
55.	Plunger, Magazine Catch	78.	Slide, Operating
56.	Plunger, Safety Spring	79.	Spacer, Fire Control Housing
57.	Plunger, Selector	80.	Spring, Automatic Sear
58.	Receiver	81.	Spring, Ejector
59.	Retainer, Breech Block	82.	Spring, Hammer
60.	Rivet, Front Bracket	83.	Spring, Hammer Lock
61.	Rivet, Bracket, (Rear)	84.	Spring, Magazine
62.	Rivet, Ferrule	85.	Spring, Operating, Inner
63.	Rivet, Liner, Hand Guard	86.	Spring, Operating, Outer
64.	Rivet, Spacer, (Lower)	87.	Spring, Extractor
65.	Rivet, Spacer, (Upper)	88.	Spring, Trigger Guard
66.	Safety	89.	Spring, Safety

	Name of Part		Name of Part
90.	Spring, Selector	97.	Trigger
91.	Spring, Magazine Catch	98.	Tube, Magazine
92.	Stabilizer	99.	Washer, Grip Bolt
93.	Stud, Trigger	100.	Washer, Lock
94.	Stud, Bracket (Front)	101.	Sight, Front
95.	Stock	102.	Sight, Rear
96.	Swivel, Sling		





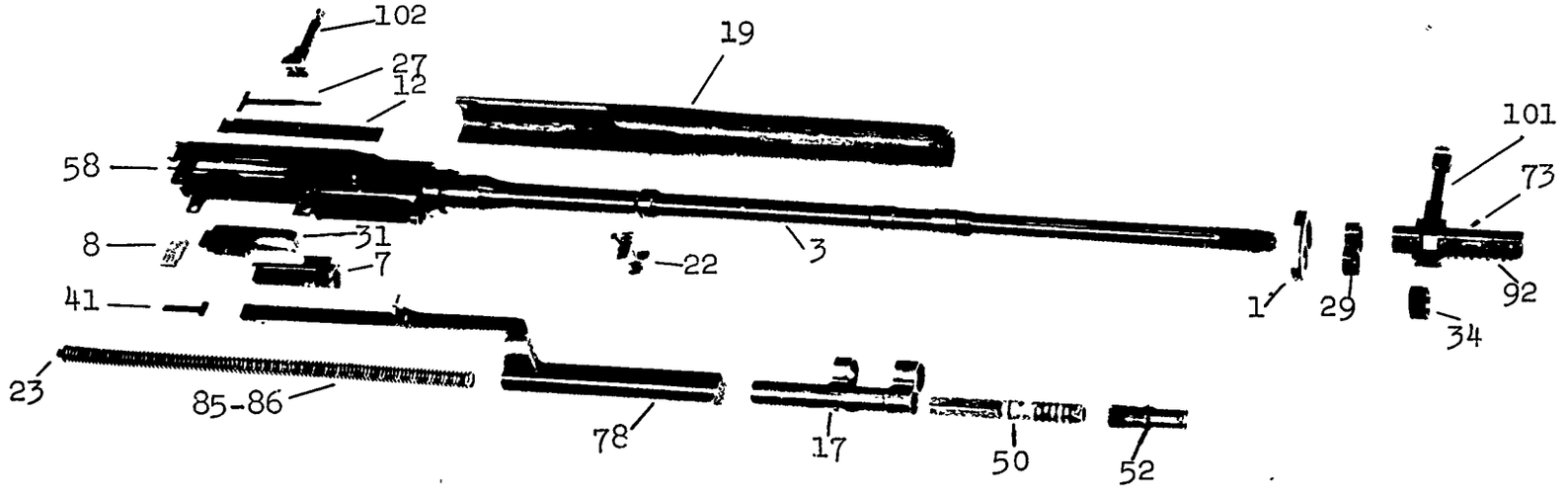
6654-SA SPRINGFIELD ARMORY - ORDNANCE DEPT 3 Jan. 1949
RIFLE, LIGHTWEIGHT, CAL. .30 - T-25
Right & Left Side Views
Left Side shown with Trigger Guard folded for winter use.



3657-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 3 Jan. 1949

RIFLE, LIGHTWEIGHT, CAL..30 - T-25

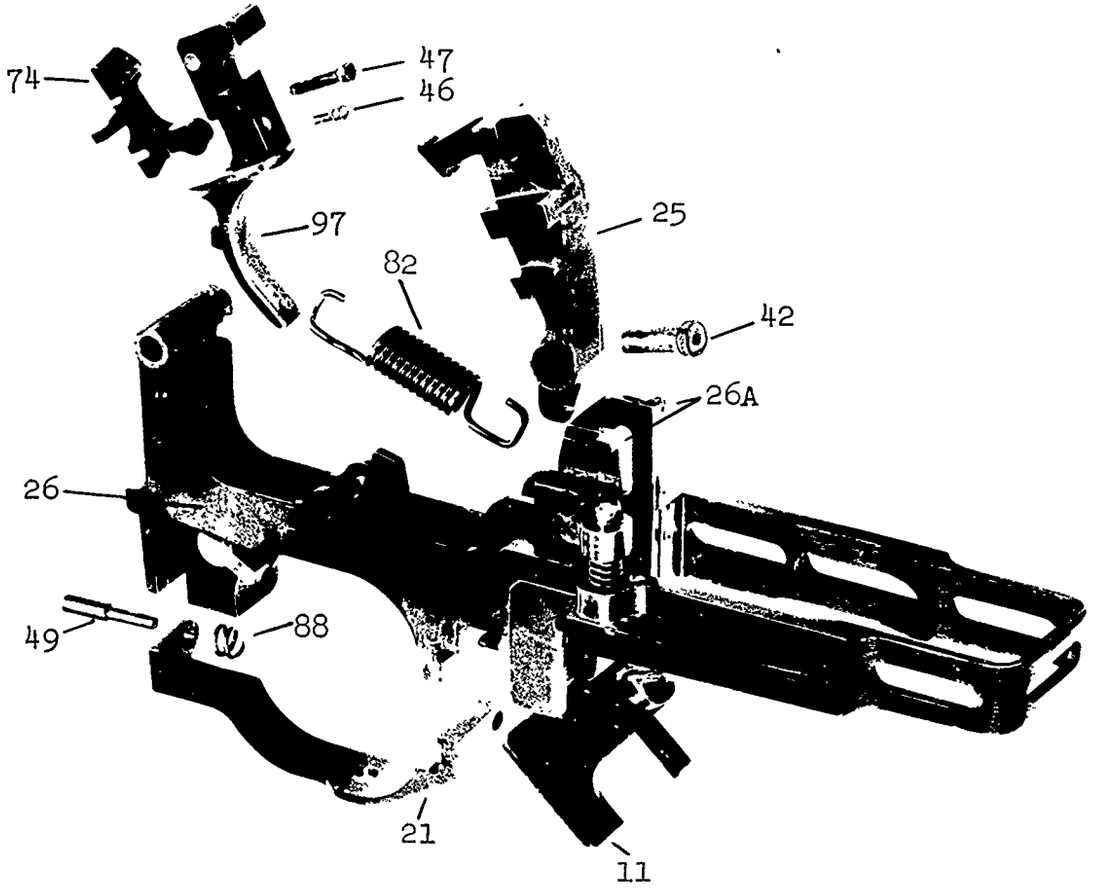
Rifle with stock removed showing main assembly



SPRINGFIELD ARMORY - ORDNANCE DEPT. 3 Jan. 1940

RIFLE, LIGHTWEIGHT, CAL. .30 - T-65

Main Assembly - Parts

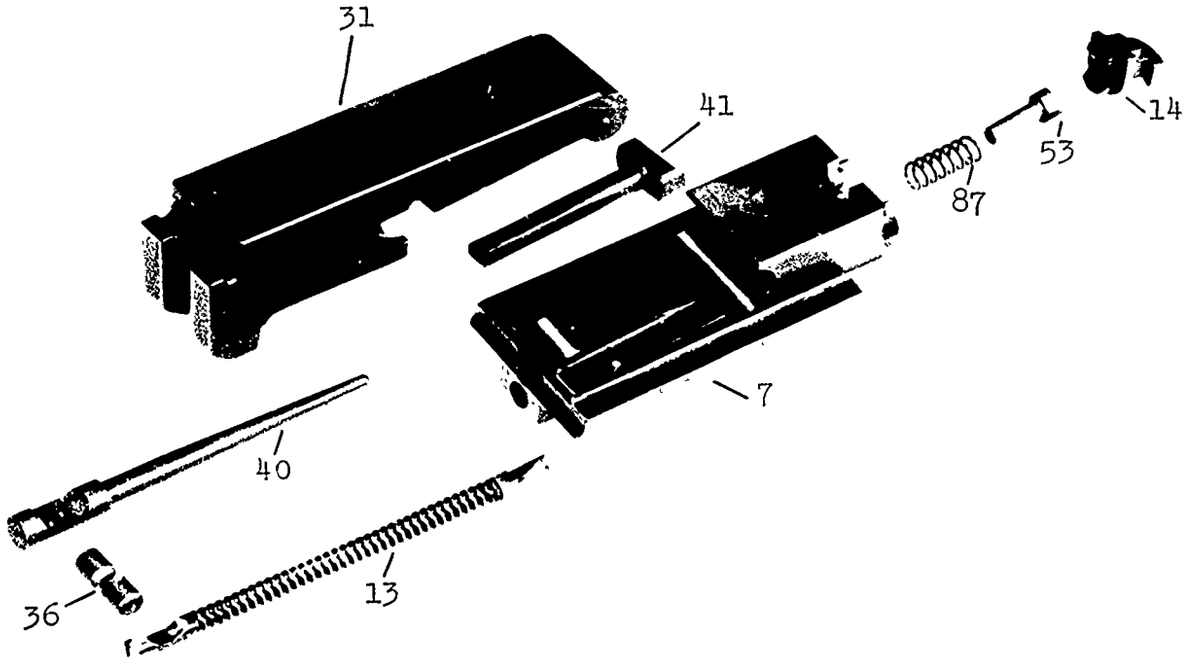


6659-SA

SPRINGFIELD ARMORY - ORDNANCE DEPT. 3 Jan. 1949

RIFLE, LIGHTWEIGHT, CAL..30 - T-25

Semi-Automatic Fire Control Group - Parts

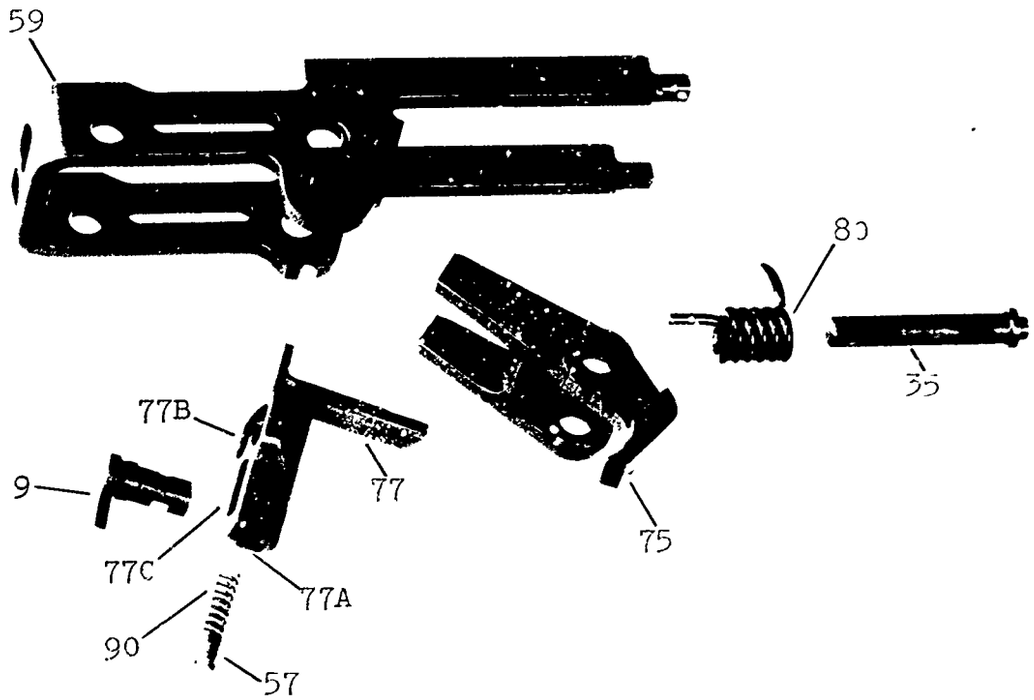


6660-SA

SPRINGFIELD ARMORY - ORDNANCE DEPT. 3 Jan. 1949

RIFLE, LIGHTWEIGHT, CAL..30 - T-25

Breech Group - Parts



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6662-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 13 Oct. 1948

RIFLE, LIGHTWEIGHT, CAL..30 - T-25

Automatic Fire Control Group - Parts

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6776-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 3 Jan. 1949

RIFLE, LIGHTWEIGHT, CAL..30 - T-25

Automatic Fire Control Group - Disengaging Selector

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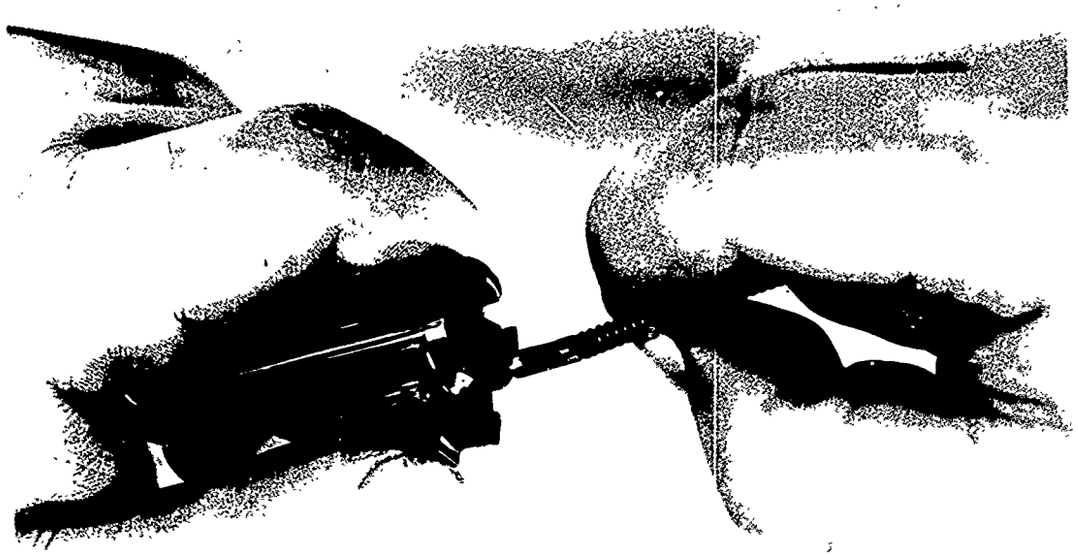
6777-JA SPRINGFIELD ARMORY - ORDNANCE DEPT. 3 Jan. 1940

RIFLE, LIGHTWEIGHT, CAL..30 - T-65

Breech Block Assembly - Removing Extractor



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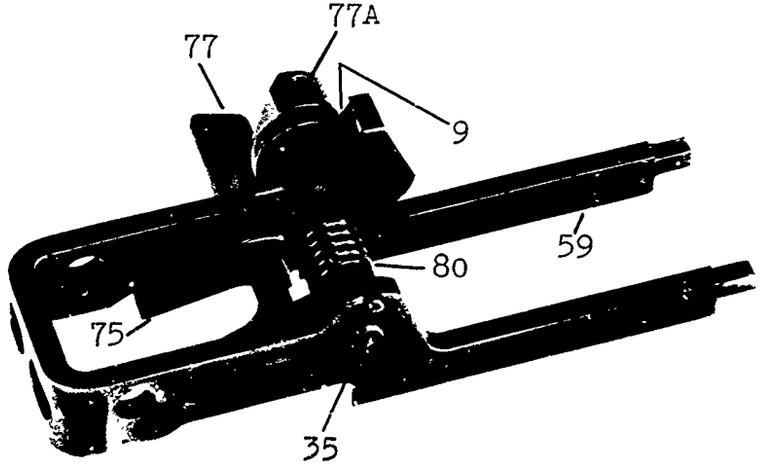
6778-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 3 Jan. 1949

RIFLE, LIGHTWEIGHT, CAL..30 - T-25

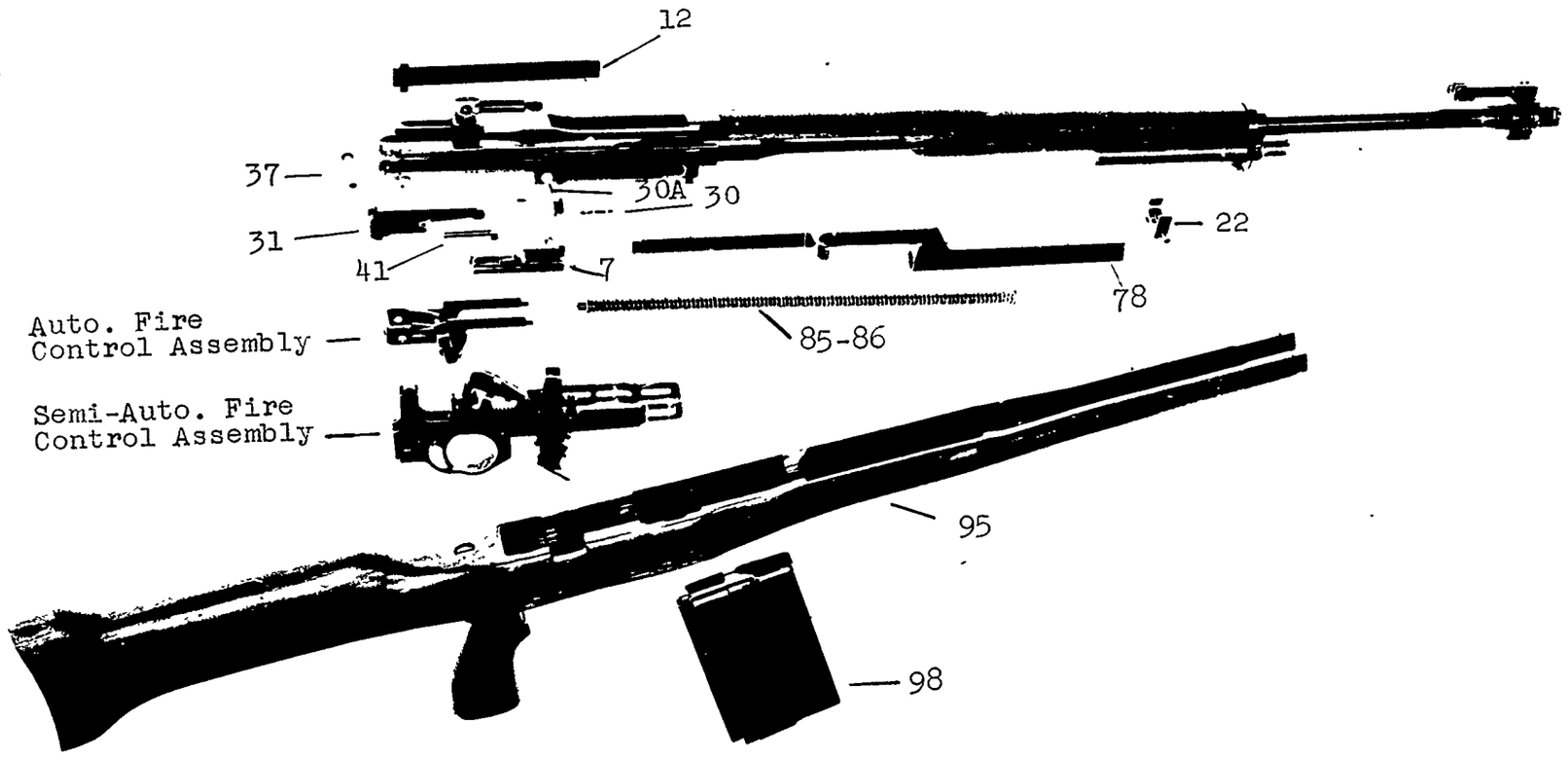
Breech Block Assembly - Replading Extractor



8779-3A SPRINGFIELD ARMORY - ORDNANCE DEPT. 3 Jan. 1949

RIFLE, LIGHTWEIGHT, CAL..30 - T-25

Automatic Fire Control Group - Assembly



6780-SA SPRINGFIELD ARMORY - ORDNANCE DEPT. 3 Jan. 1949

RIFLE, LIGHTWEIGHT, CAL..30 - T-25

Field Stripped